

KiweeOne

User Manual



User manual V1 April 2021

KiteWinder

1 allée Jean Rostand

33650 Martillac, France

Tel : 06 03 88 82 52

sales@kitewinder.fr

www.kitewinder.fr

Made in France

1. Safety

For your safety and the safety of those who may be near the KiweeOne while using it, please observe the following guidelines at all times :

- Do not rotate the blades when KiweeOne is not in flight and near other people or animals.
- Do not make any changes to KiweeOne.
- Comply with local codes, laws and aviation regulations.
- Do not open the electrical box when it is powered.
- Do not operate the KiweeOne if any component is damaged.
- Do not attempt to puncture, burn or heat the battery.

In this manual you will find the following symbols :



WARNING

Indicates a risk of serious injury or equipment damage. Use caution and follow the instructions.



IMPORTANT

Indicates an important instruction or advice for proper assembly or use to avoid equipment damage.



ADVICE

Indicates an instruction that may simplify a task.



INFORMATION

Indicates an information that can help you to understand more how your KiweeOne works.

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2. Introduction

For safety reasons, read this user guide carefully before using your KiweeOne. Failure to follow this instructions may cause damages to the KiweeOne and/or it's user.

These instructions are intended for the user of the KiweeOne wind turbine and any person who may be near it when using it.

This owner's manual is an important part of your KiweeOne. It provides rules and guides that will help you use your KiweeOne safely and efficiently. You should familiarize yourself with the functions and operations by carefully reading this user guide. For your safety, it is very important that you follow all the recommendations.

Please keep this owner's manual for future reference. If the instruction manual is lost or damaged, a printable PDF version is available for download on our website: *www.kitewinder.fr*

This manual describes the safety instructions to be applied by the user. It is the user's responsibility to take care of his own safety and that of other persons concerned, in accordance with the instructions given to him.

Do not store heavy objects on top of your KiweeOne and avoid impacts, especially on the blades.

3. How it works

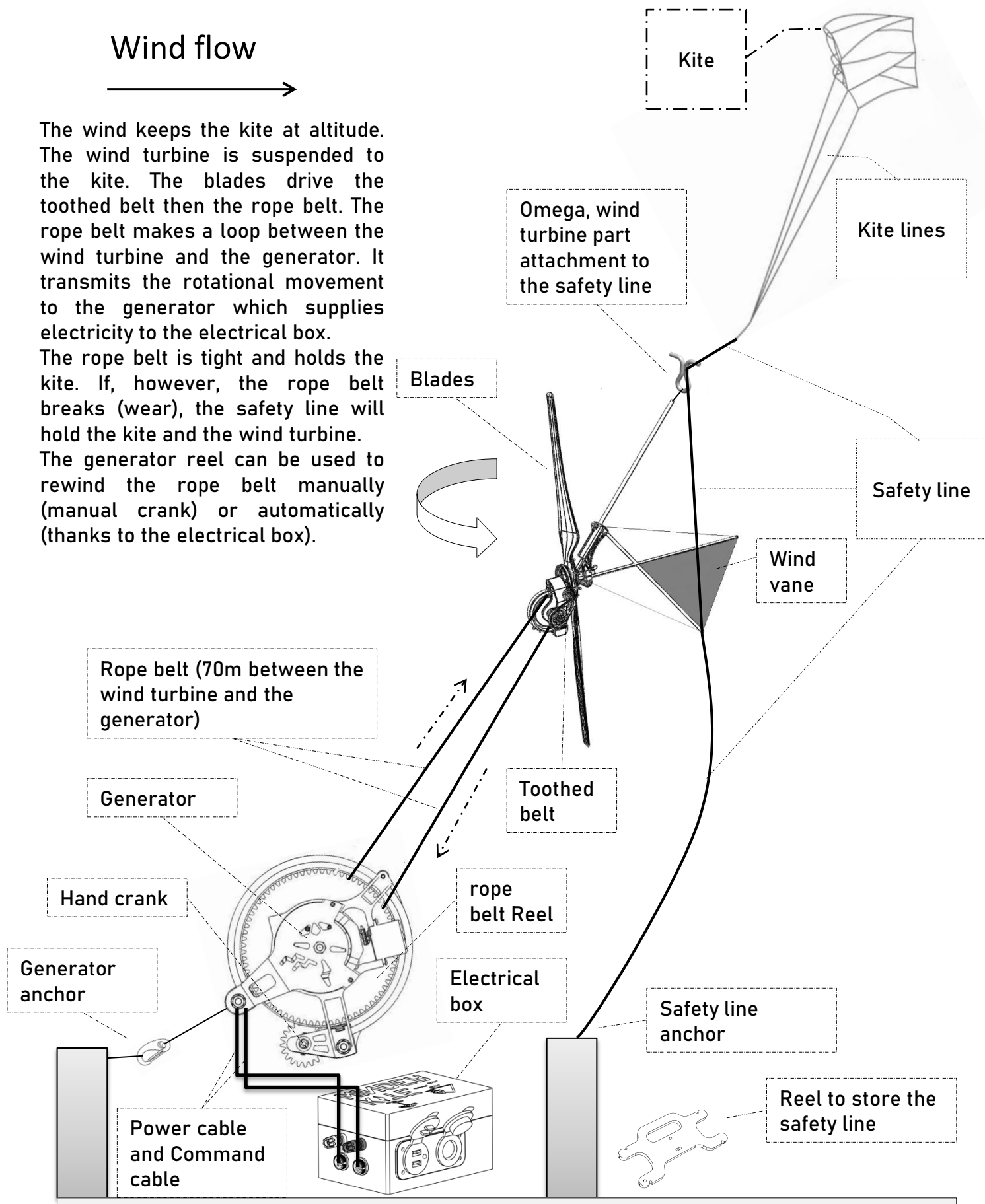
Wind flow



The wind keeps the kite at altitude. The wind turbine is suspended to the kite. The blades drive the toothed belt then the rope belt. The rope belt makes a loop between the wind turbine and the generator. It transmits the rotational movement to the generator which supplies electricity to the electrical box.

The rope belt is tight and holds the kite. If, however, the rope belt breaks (wear), the safety line will hold the kite and the wind turbine.

The generator reel can be used to rewind the rope belt manually (manual crank) or automatically (thanks to the electrical box).



4. General Principle

When using the wind turbine, the **generator** must always be **connected** to the **electrical box**. The power cable transmits the electricity produced to the electrical box and its internal battery. The electrical box will then power your equipment. The command cable allows the transmission of information between the generator and the electrical box.

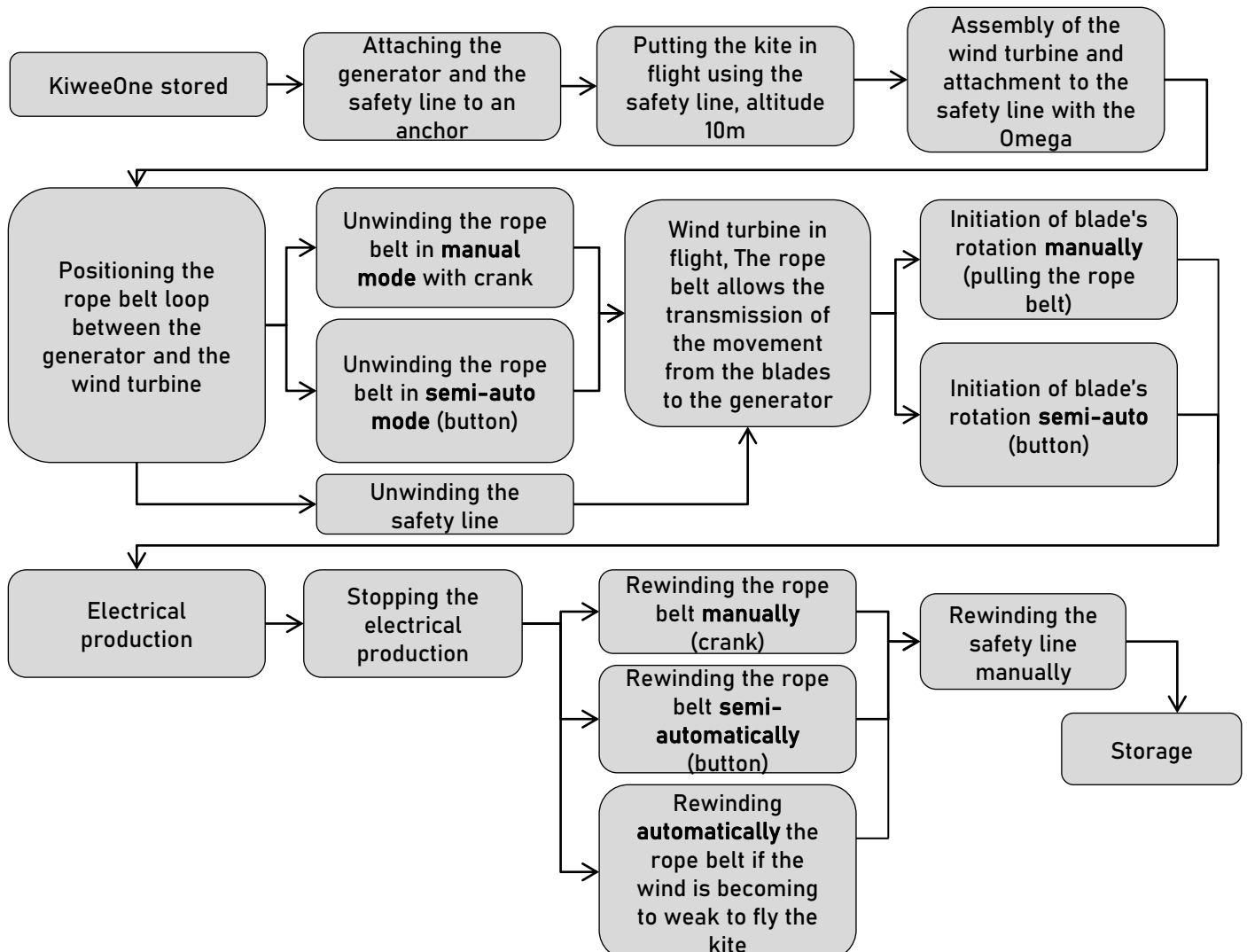
The generator is composed of a **reel** for **storing** the rope belt (rewound) and a servomotor controlling a locking pin. It allows **3 positions** : rotation blocking (storage), free rotation (unwinding, production, rewinding) and start of rewinding (used to hook the rope belt loop in order to start rewinding). These 3 modes can be activated **manually** or **automatically**.

Unwinding of the rope belt can be done **manually** with the **crank** or **semi-automatically** using a **button** on the box. In semi-auto mode, the servomotor automatically changes position and the generator unwinds the entire rope belt.

To **produce** electricity, the **rotation of the blades** must be started **manually** by pulling on the rope belt or **semi-automatically** using a button on the box. During electricity production, the **crank** should be placed on the **smooth** side of the generator as it serves as a balancing mass.

The **rewinding** of the rope belt can be done **manually** with the crank, **semi-automatically** thanks to a button on the box or fully **automatically** if the generator detects a wind too weak to continue to fly the wind turbine.

Here is a summary of the steps for using the KiweeOne :



5. Description

5.1 Technical Specifications

Mass and dimensions :

- Total mass	≈ 4.5kg
- Flying mass	≈ 0.8kg
- Turbine diameter	1,10m
- Kite size	4 m ²
- Length of the rope belt (between the wind turbine and the generator)	≈ 70m (140m loop)

Wind speeds :

- Starting wind speed	4,2 m/s (15 km/h)
- Nominal wind speed (100W)	8 m/s (29 km/h)
- Maximum wind speed	25 m/s (90 km/h)

Operating temperature :

-10°C à +40°C

Battery capacity

80 Wh

	2x USB outlet Type-A	Cigarette lighter outlet 12V/24V	Terminal block 12V/24V
Out	5V/1A 5V/2.1A	12V/8A or 24V/5A	12V/8A or 24V/5A
Power	100W in total		
Charge type	Standard	Constant current Constant voltage	Constant current Constant voltage



WARNING : The electrical box can be configured in 12V or 24V. Always check the compatibility between your equipments and the configuration of your electrical box. Go to p18 for more details.



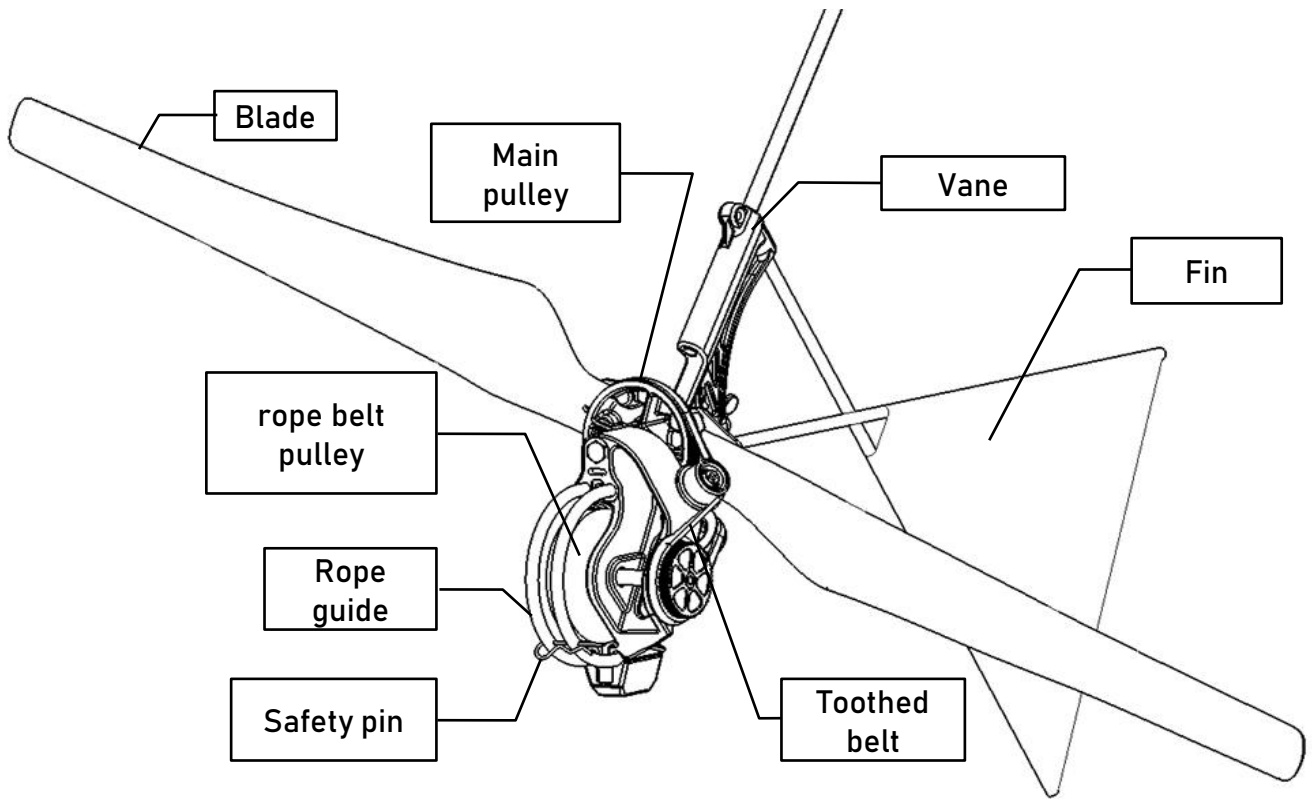
INFORMATION : Your electrical box is protected against short-circuit.



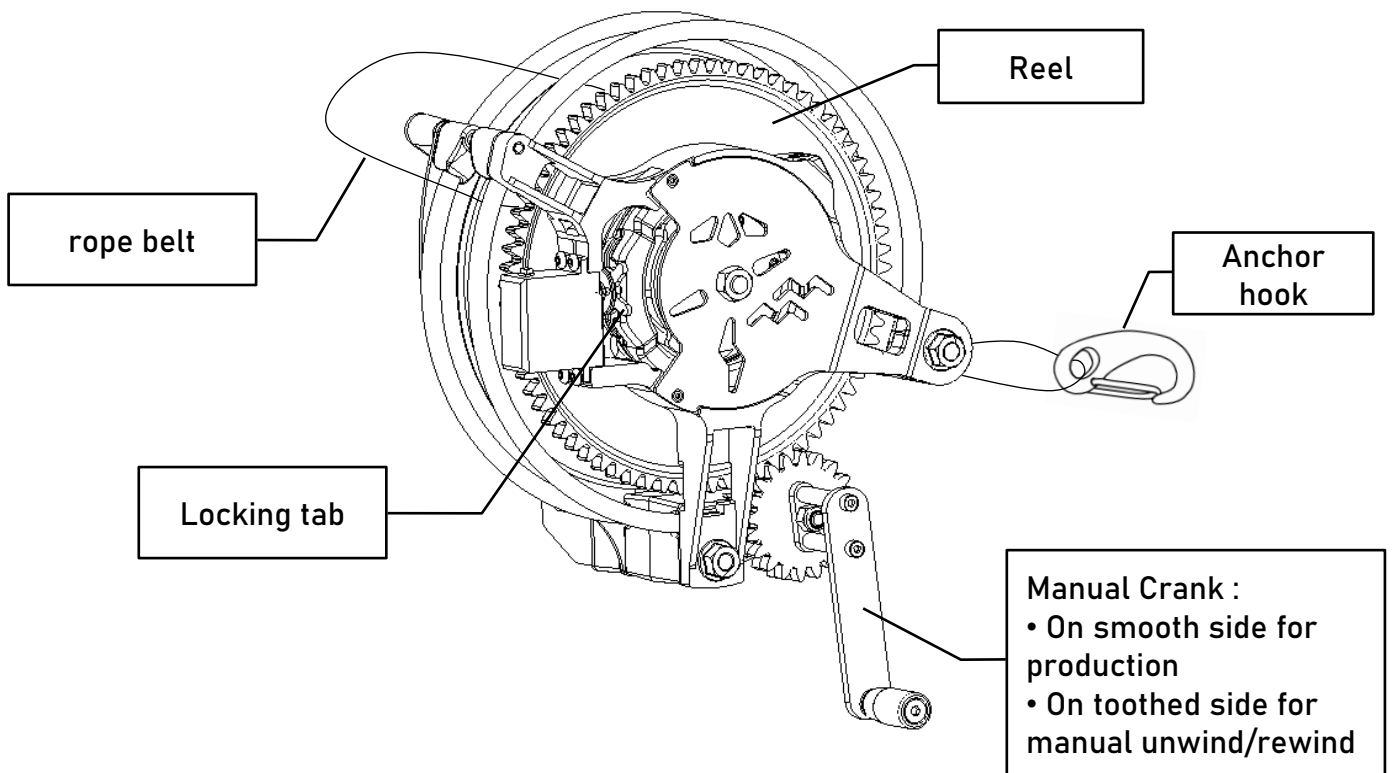
INFORMATION : The 12v and 24V modes are actually 14V and 28V (allows charging of lead batteries).

5.2 Structure components

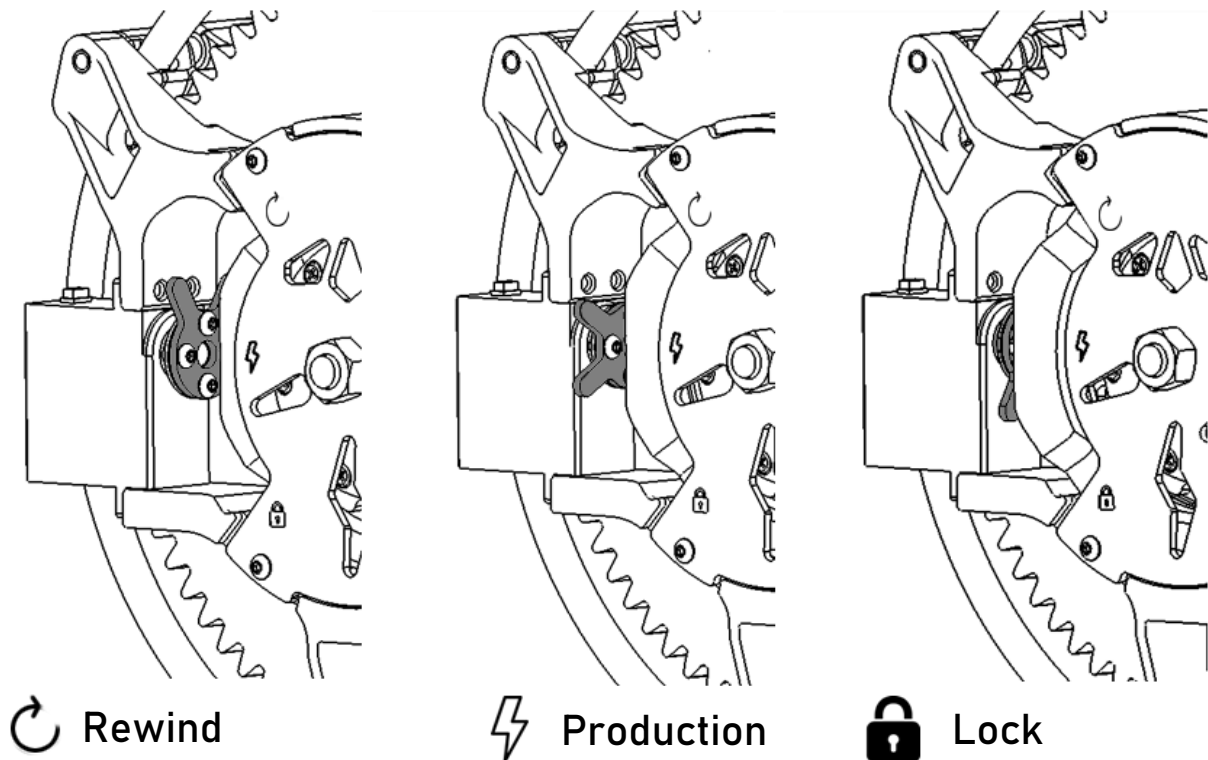
5.2.a Wind turbine



5.2.b Generator



Locking tab positions (servomotor)



Rewind : in this position a small stainless steel pin located inside the reel will come out and try to hook the loop of the rope belt to allow the start of rewinding.

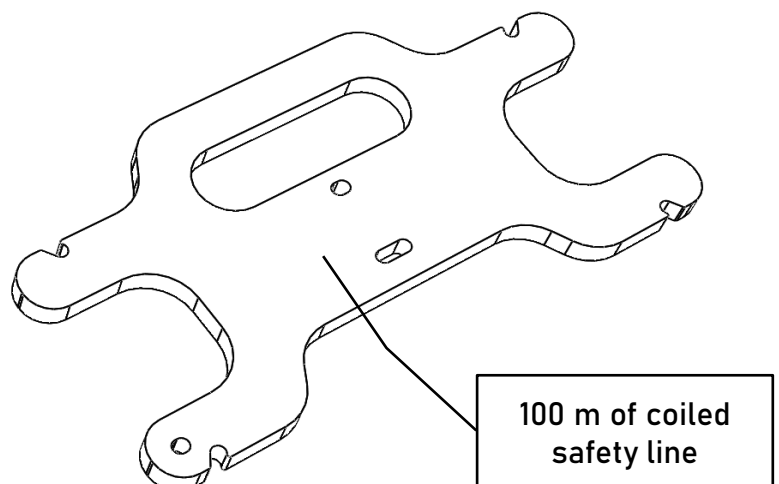
Production : in this mode, the rotation of the generator reel is free and allows unwinding, electricity production and rewinding.

Lock : in this mode, the rotation of the reel and the generator is locked (storage).

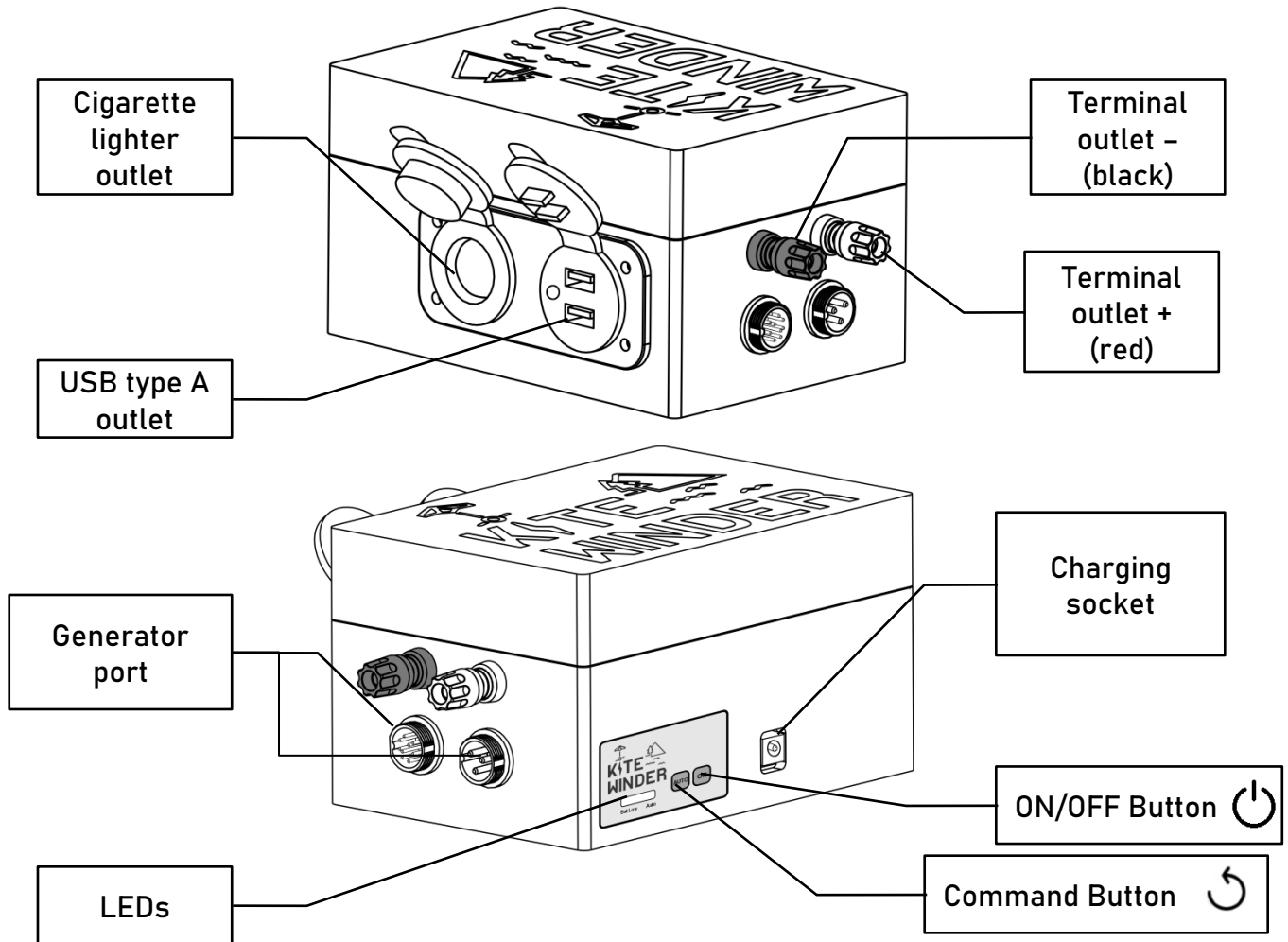
The locking tab can be operated by hand when unwinding and rewinding manually. When these operations are automatically controlled the tab will change its position automatically (servomotor).

5.2.c Safety line reel

This part is only used for winding and storing the safety line. It should not be used as a hook or anchor for the safety line when the rope belt is deployed and tied to the kite.



5.2.d Electrical box



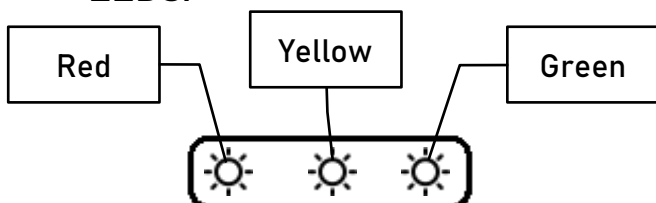
The terminal block, cigarette lighter and USB sockets are the outputs of the box, to which you can connect your suitable electrical equipments. The terminal block and cigarette lighter outputs are configurable in 12V and 24V (factory setup 12V).

If a USB device is plugged in but the generator cables are not, the box functions as a battery and will power your USB equipment. To do this, disconnect the control and power connectors, connect your USB, switch on the box (keep ON for 3s). If nothing is connected to USB, the electric box is shutting off after 30s.

The generator connectors are to be connected to the generator cables for the production of electricity and the control of unwinding / rewinding in automatic mode. The ON / OFF and COMMAND buttons are used to control the wind turbine. The electronic box automatically manages electricity production by seeking the optimum production.

At first start, the electrical box must be paired to the generator. See p19 how to configure it.

LEDs:



IMPORTANT :

The LEDs can light up in different ways. The meaning of these different signals are explained on page 19 and 20.

6. Using KiweeOne

6.1 Kite launch

It is recommended to familiarize yourself with launching KiweeOne in a flat, open area within a radius of 50m. The kite is launched using the safety line.

6.1.a Anchor point for the safety line

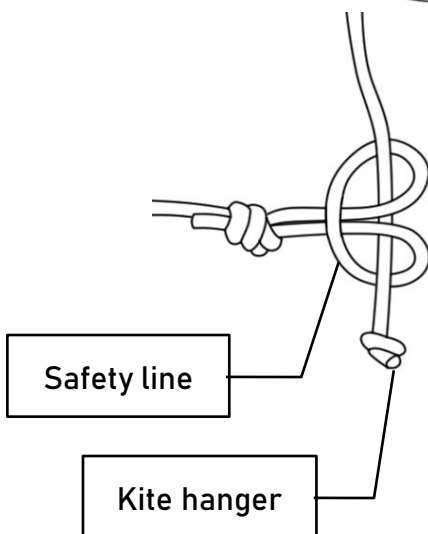
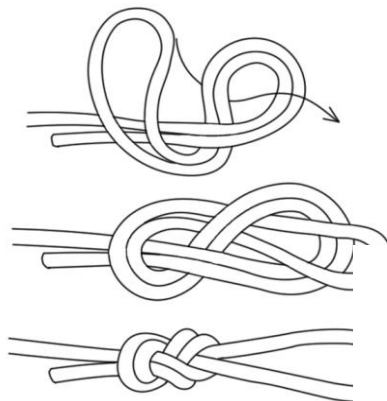
Carefully chose your anchor, it must withstand the pull of the kite even if the wind increases.

Some anchor examples :

- Tree stump
- Bag filled with sand or rocks
- Car roof rack
- Stick stuck in the ground



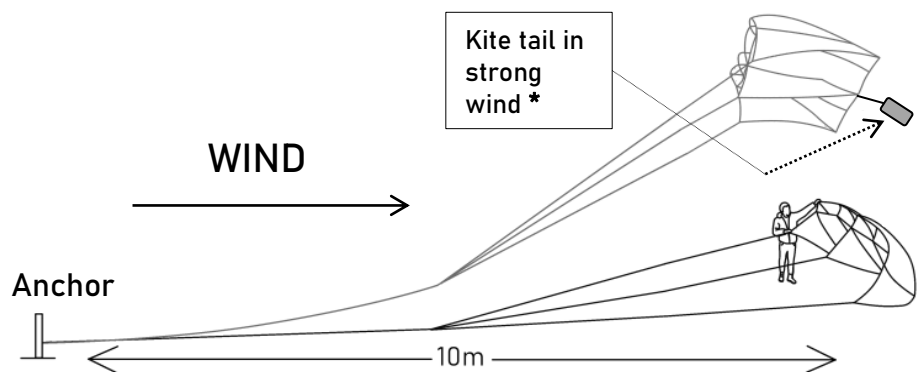
IMPORTANT : with a wind of 20 km/h, the kite will pull with an equivalent force of 4kg on the anchor. With a wind of 90 km/h, the force will be equivalent to 20kg. We advice you to use an anchor that can resist twice the force exerted by the kite.



6.1.b Deployment

Unfold your kite. Be careful to disentangle the lines correctly. Tie your kite to the safety line with the knot shown in the figure on the left.

You can then deploy your kite as follows:



6.1.c Check

Make sure the kite is stable. In light wind, if pull is too weak, or it swings from side to side, slack off the safety line a bit to bring the kite up in altitude. In strong wind, if the kite is too unstable, hang the kite storage bag on the kite as a tail (see illustration above *).

6.2 Assembly

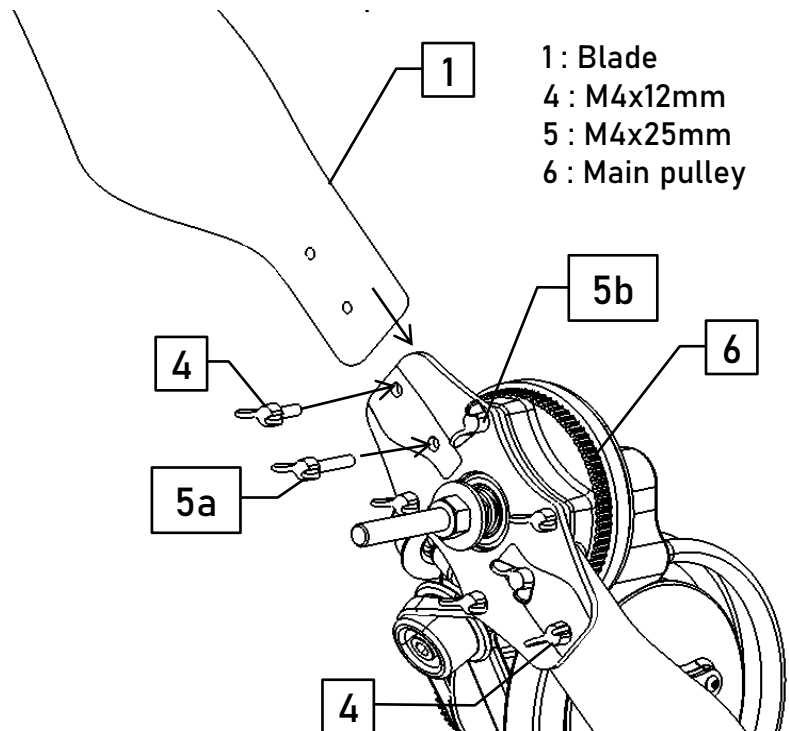
6.2.a Setting up the wind turbine

Blades fixation

- Remove the butterfly screws (4 and 5a) from the blades.
- Partially unscrew the butterfly screws (5b) from the pulley (6).
- Insert the blades (1).
- Put back all the screws (4 and 5) being careful with the lengths (screw 4 is the smallest).
- Tighten properly by hand (do not use any tool).



IMPORTANT : Be careful to insert the blades in the right direction. Refer to the engraving on the aluminum plate.



Vane fixation

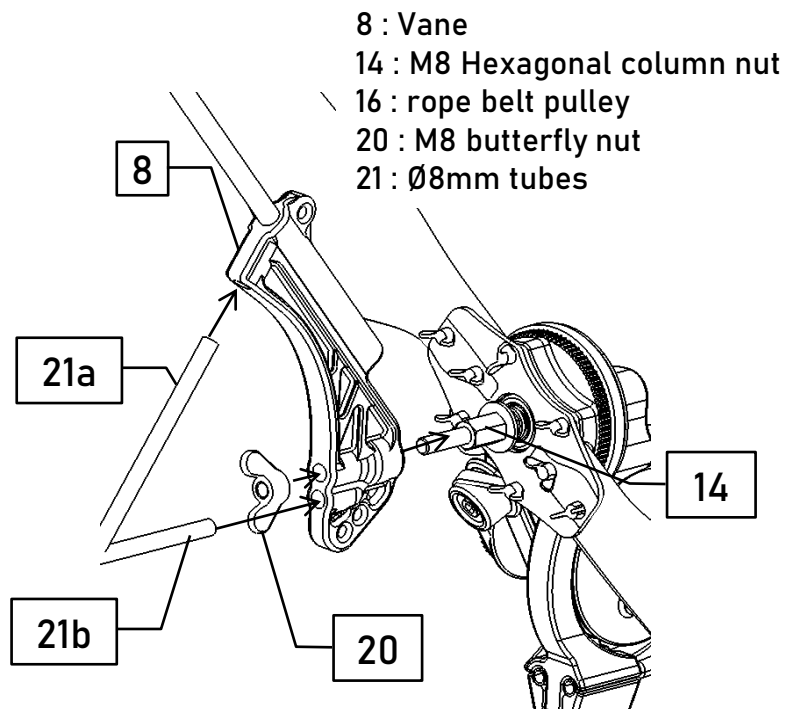
- Unscrew the butterfly nut (20).
- Insert the upper tube (21a).
- Insert the vane (8) on the hexagonal column nut (14). The vane must be in the same plane as the rope belt pulley.
- Screw the butterfly nut (20).
- Insert the lower tube (21b).



ADVICE : The upper tube (21a) is the one with a twisted screw at its end.



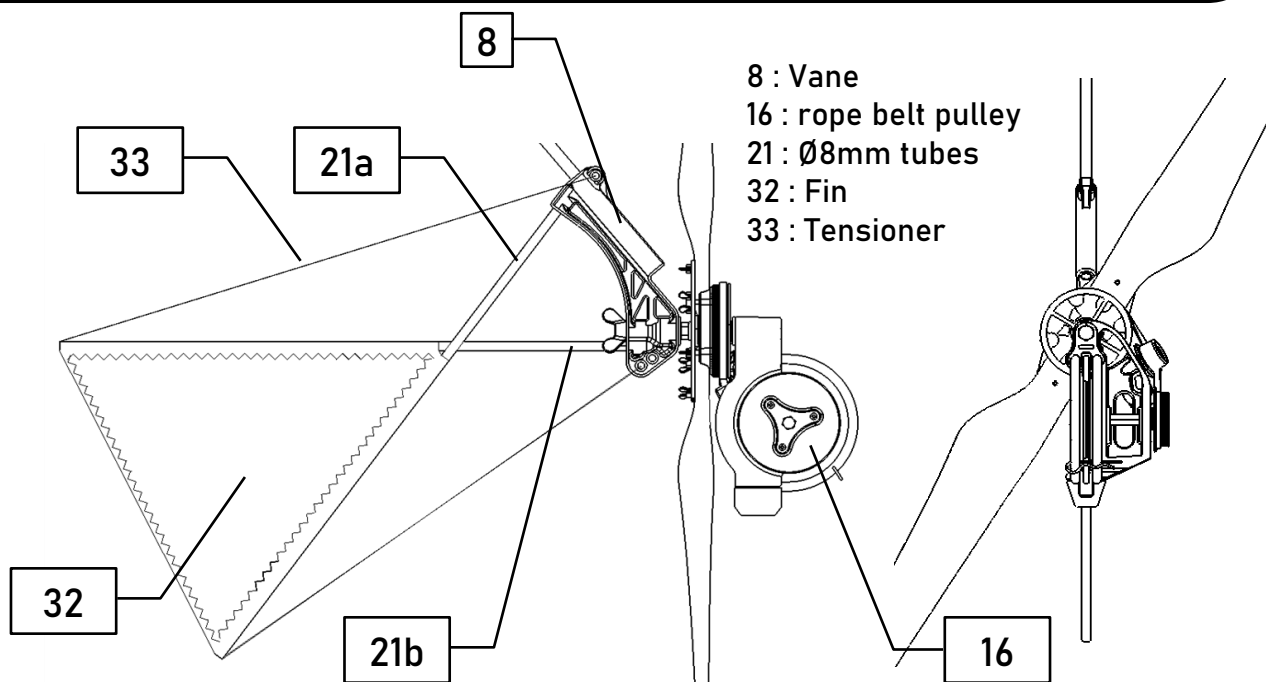
IMPORTANT : Pay attention to untangle the tensioner (33) of the fin (32) and to not cross them when assembling the tubes.





INFORMATION :

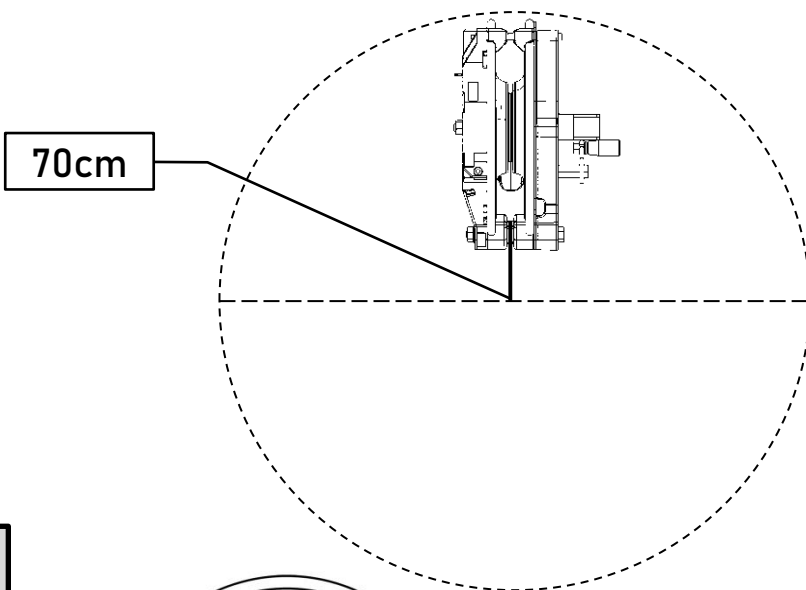
Once fitted, the lower tube (21b) blocks the butterfly nut (20), which prevents it from unscrewing.



6.2.b Generator anchoring

Find an anchor for the generator. It can be the same support as the safety line. However, it must meet the same resistance requirements (see page 11).

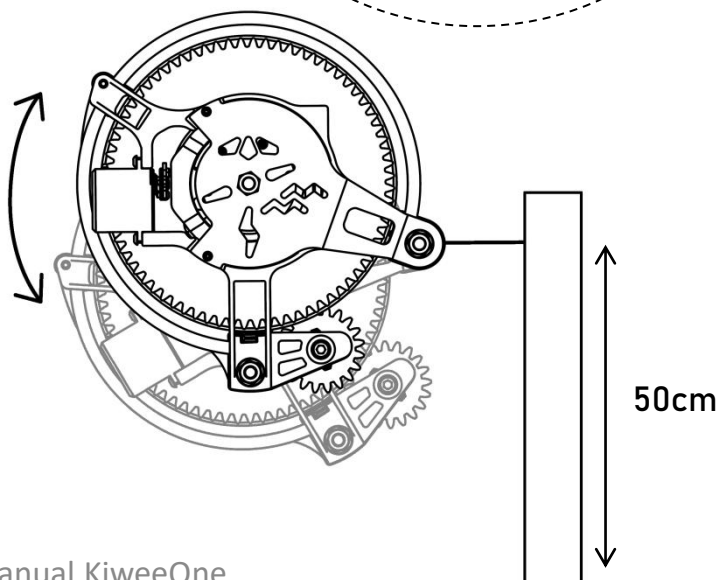
Be careful to respect horizontal and vertical clearance.



IMPORTANT :

During occasional use and with steady wind, provide an horizontal clearance of 180°.

During continuous use and/or with a wind changing direction, provide an horizontal clearance of 360°.

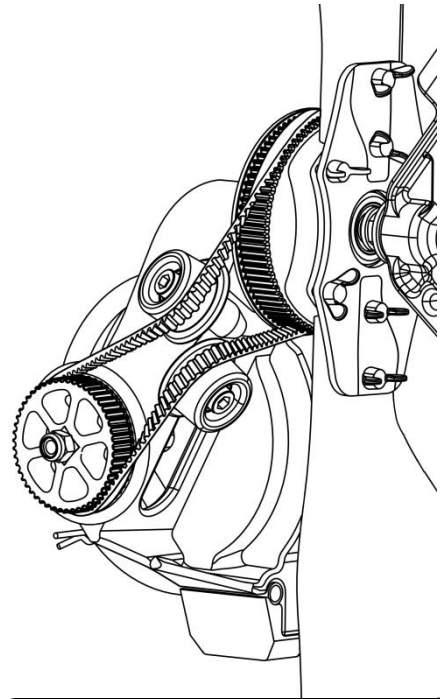


6.2.c Check-list

Before proceeding further, take the time to check the correct tightening of all screws.

Check the position of the toothed belt. It must be positioned as shown in the right image.

The toothed side is positioned on the toothed pulleys and the smooth side on the two small pulleys.

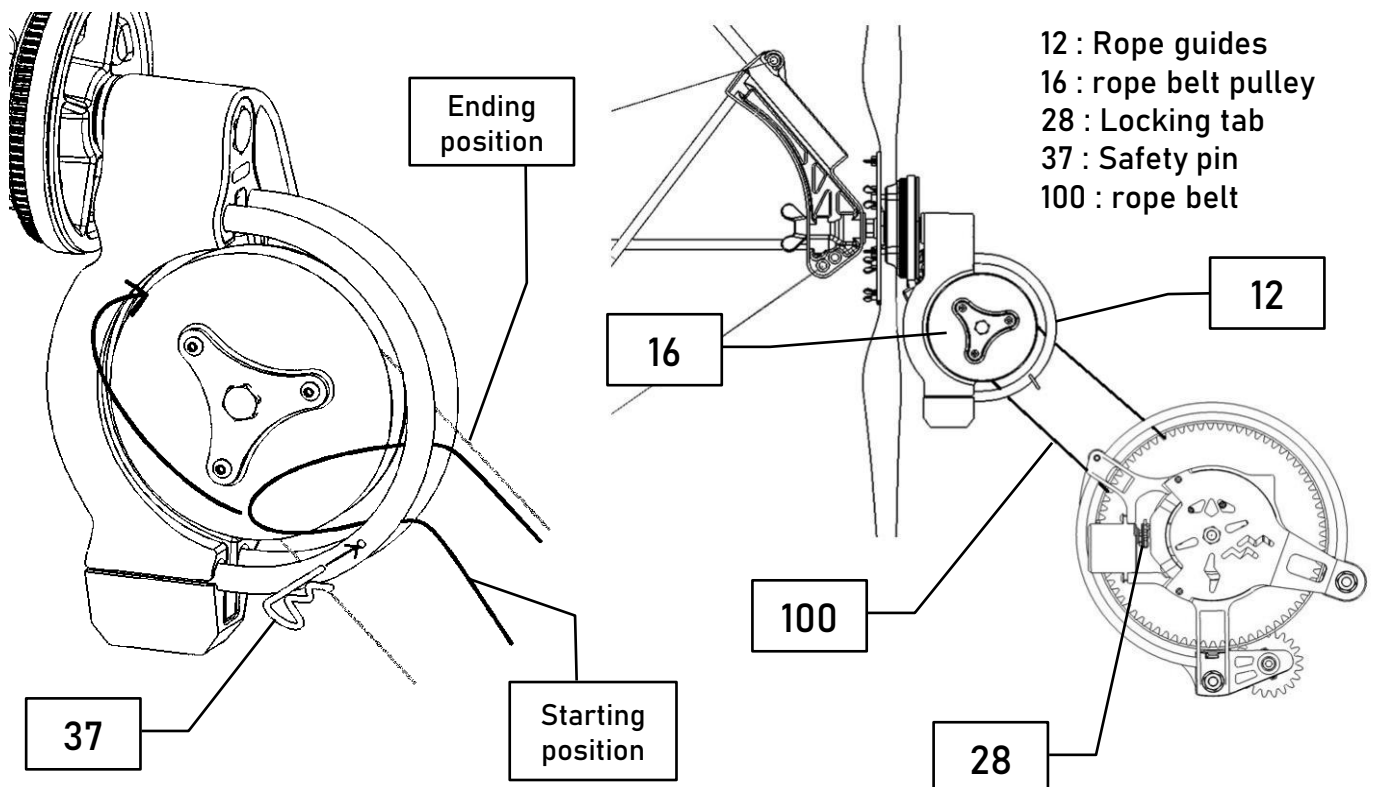


6.2.d Setting up the rope belt on the wind turbine

- Unlock the locking tab (28) (Production position), see positions p9.
- Unreel by hand about 1m of the rope belt (100)
- Lock back the locking tab (Lock position)
- Remove the safety pin (37)
- Pass the loop between the guides (12), and behind the rope belt pulley (16)
- Put back the safety pin.

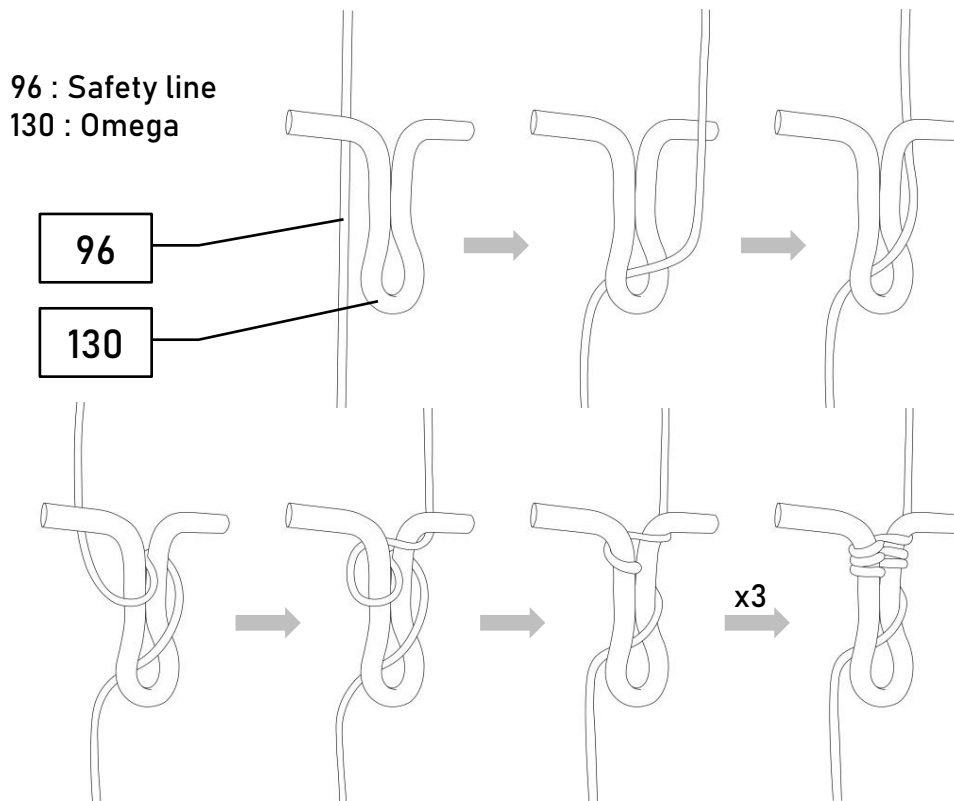
! **IMPORTANT** : The upper strand on the generator must be placed on the upper side of the rope belt pulley.

IMPORTANT : The safety pin must separate both strands of the rope belt.

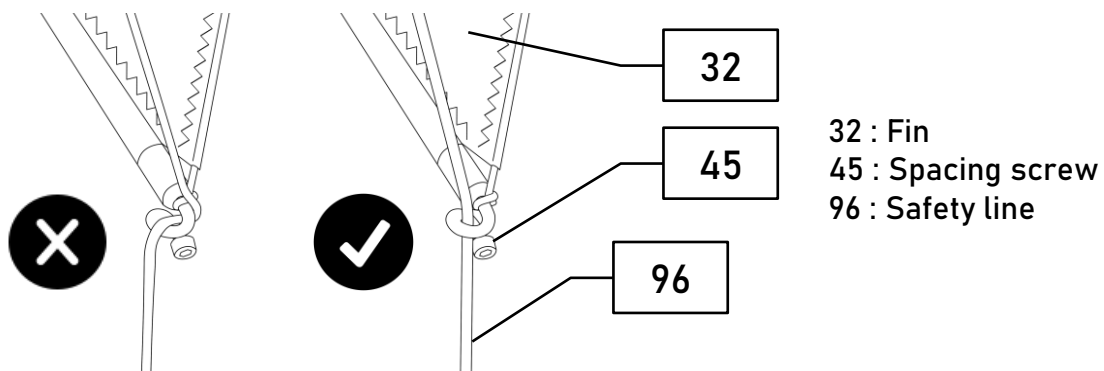


6.2.e Linking the wind turbine to the safety line

- Attach the omega (130) located at the top of the vane to the safety line (96). The distance between the kite and the wind turbine is thus to be defined by you according to the wind conditions. We recommend 10 to 30m in small wind, and 2 to 10m in strong wind.



- Pass the safety line through the distance screw (45) located at the end of the fin (32) in order to guide its trajectory and prevent it from being entangled with the blades.



6.3 Wind turbine manual launch

The KiweeOne can be deployed semi-automatically or manually. The semi-auto mode is preferred when internal battery level is sufficient. Manual mode requires unwinding the entire rope belt using the manual crank.

The semi-automatic mode is described in the section “How to use the electrical box” p19.

The following section describes the unwinding process of the rope belt in manual mode.

Manually unreeling the rope belt

- Install the crank, handle downward, on the toothed flange side.
- Block the crank with your forearm, then unlock the locking tab (Production position) as shown on figure 2.
- Unreel by turning the crank clockwise
- Once the rope belt is fully reeled out, put the crank back on the smooth flange side (allows the generator to be balanced during production mode).

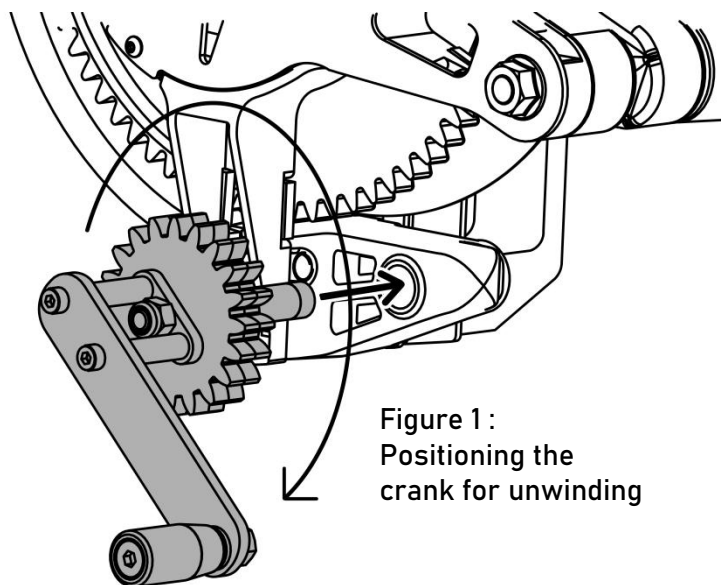


Figure 1 :
Positioning the
crank for unwinding

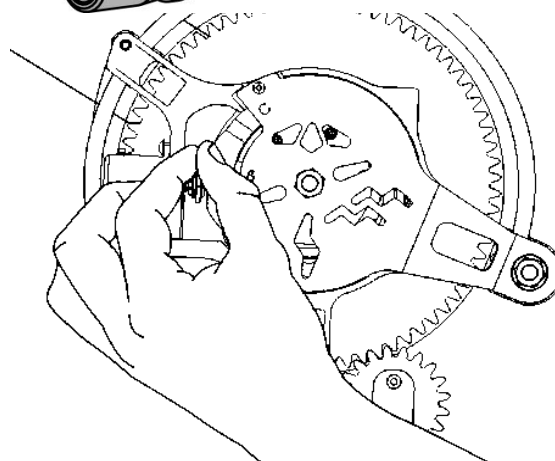


Figure 2 :
Setting up the locking tab in Production
mode (middle)



WARNING: Once the locking tab is on the Production position, the traction force from the kite will make the reel and the crank rotate quickly. Be careful to always control the rotation of the crank, to prevent injuries.



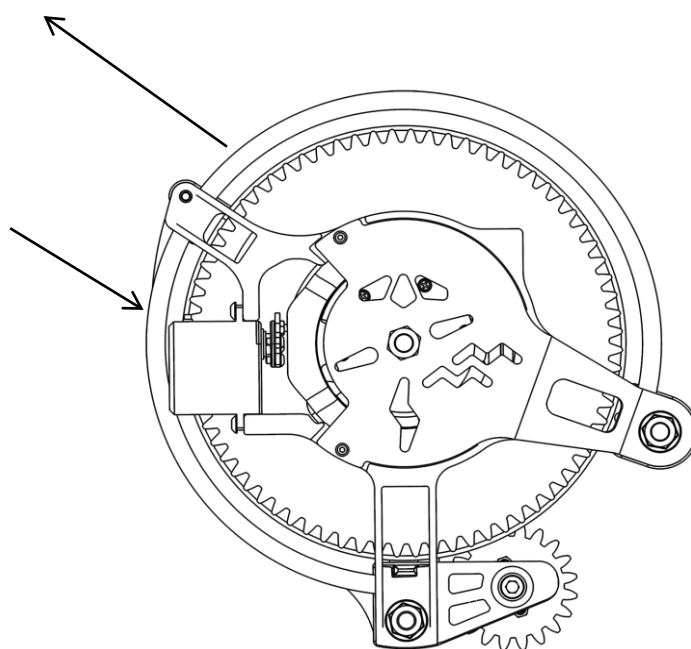
IMPORTANT : Pay attention to your safety line : if it does not have enough length, lock back the locking tab, let go some length on the safety line and then restart unreeling the rope belt.

Manually starting the rotation of the blades

- Check that the locking tab is on the Production position and that the reel is rotating freely.
- Grab the rope belt upper strand near to the generator.
- Pull in the direction of the wind turbine. If the wind is strong enough, the rotation of the blades will be maintained.



ADVICE : In light wind, several tries might be needed. Adjust your strength : the weaker the wind, the slowest the blades should rotate.



6.4 Bringing back KiweeOne

The KiweeOne can be brought back automatically, semi-automatically or manually. Auto and semi-auto modes are only possible in moderate wind. The automatic mode allows KiweeOne to detect a decrease in wind force and rewind the rope belt without any user action. The wind turbine and the kite will then land close to the generator.




The semi-automatic mode allows you to start the reeling procedure using a button on the electrical box on demand (button). Manual reeling should be used when the other modes are not possible (KiweeOne battery too low or wind too strong to be handle by the generator).

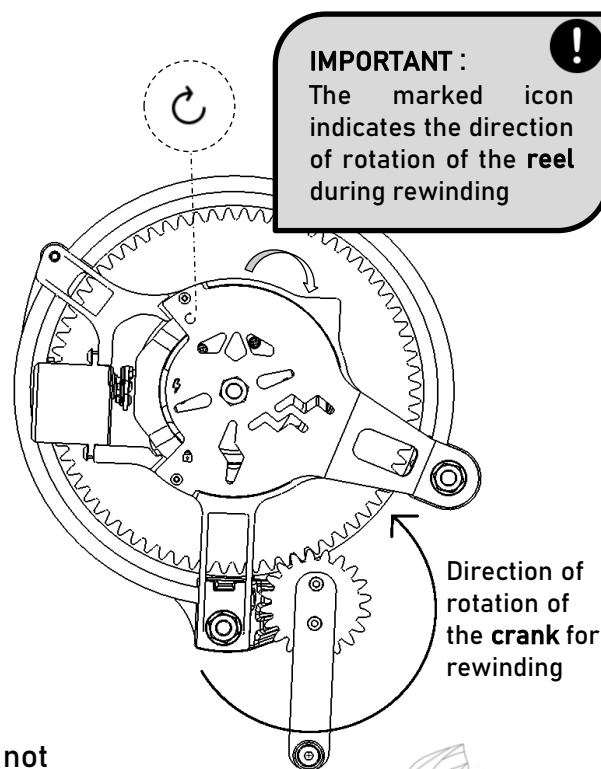
Manually stopping the blade's rotation

You can stop the blades easily by pulling on the safety line until the rope belt is slack. This will turn the blades off the wind and stop them.


Reeling in

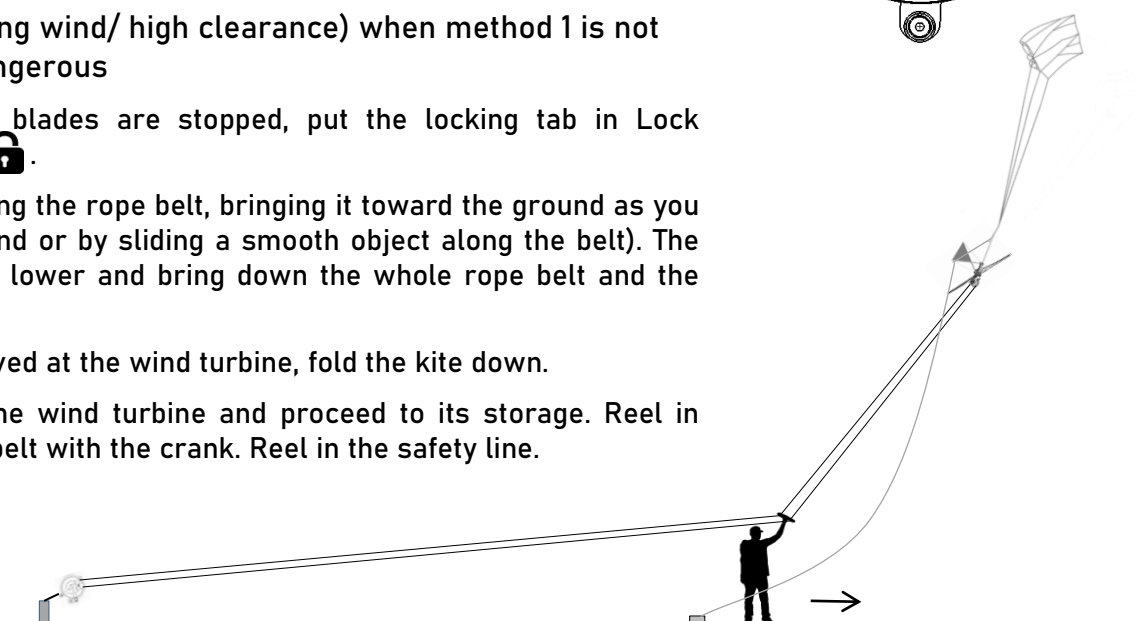
Method 1 (small wind/ reduced clearance)

- Once the blades are stopped, put the locking tab (28) on the Rewind position .
- Install the crank on the toothed flange side.
- Turn the crank anticlockwise a dozen times. Check if the loop has started to reel in.
- Put the locking tab on the Production position , then continue reeling in until there is about 1m of belt left.
- Put the tab in Lock position .
- Reel in the safety line and anchor it in a way that the rope belt is totally loose.
- You can now unhook the wind turbine and proceed to its storage.



Method 2 (strong wind/ high clearance) when method 1 is not possible or dangerous

- Once the blades are stopped, put the locking tab in Lock position .
- Go up along the rope belt, bringing it toward the ground as you go (by hand or by sliding a smooth object along the belt). The goal is to lower and bring down the whole rope belt and the kite.
- Once arrived at the wind turbine, fold the kite down.
- Unhook the wind turbine and proceed to its storage. Reel in the rope belt with the crank. Reel in the safety line.



6.5 Using the electricity

6.5.a Connections

Connection types available on the box are described p7.

KiweeOne automatically detects when a device is plugged on one of its outlets. The electronic box then checks if it is possible to power the device. KiweeOne will NOT power the device :


- If the device is a 12V Battery and the box is set on 24V mode.
- If the device is a 24V Battery and the box is set on 12V mode.
- If the device is a battery and was plugged on the wrong polarity (only on the terminal block and the cigarette lighter outlet).

6.5.b Internal battery charge rate


KiweeOne smartly manages the charge rate of it's internal battery in order to keep enough energy for automatic reel out and reel in. :

- Under 40%, the cigarette lighter outlet and the terminal block are turned off.
- Under 30%, all outlets are turned off.

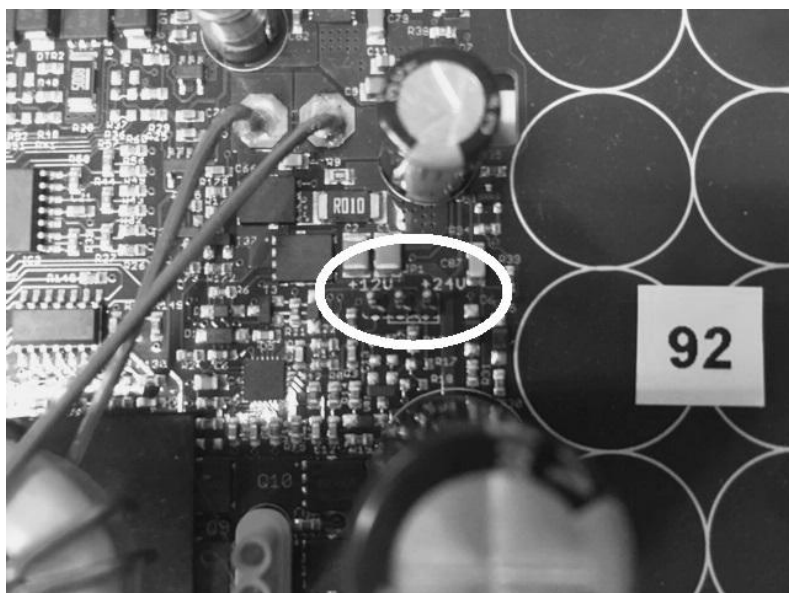
The battery charges when the wind turbine is operating. You can also charge with the charge socket using a 10S 42V/2A charger and Jack 5.5*2.1 connector (not provided with the KiweeOne).

 **WARNING :** KiweeOne will **NOT** check the device if it is not a battery. Plugging a 12V device while the box is on 24V will damage the device.

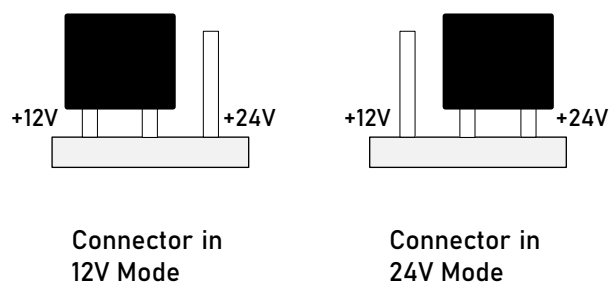
The terminal block and the cigarette lighter outlet work in parallel. Once a device is powered by one of these two outlets, security is **turned off** on the second one. This can create a risk in the case of a bad connection.

 **WARNING:** Stay alert and always check by yourself the compatibility before plugging in your devices.

6.5.c Setting the output voltage





Factory setup of the electrical box is 12V. To set it to 24V, open the box (4 cruciform screws) and move the connector circled in the left picture to the position shown below. Kitewinder is not responsible for any damage made to your equipment as a result of improper handling .




6.6 How to use the electrical box

The electrical box enables the rope belt to be unwound automatically and thus deploy the wind turbine at altitude. It then manages the launching of the blades and the electrical production. These actions are triggered by pressing buttons on the box. The repatriation of the wind turbine can be done automatically below a certain critical wind threshold or manually on demand.

 When going through certain stages, the locking pin will change position, the generator will rotate, the blades will start at high speed, be careful with your hands !

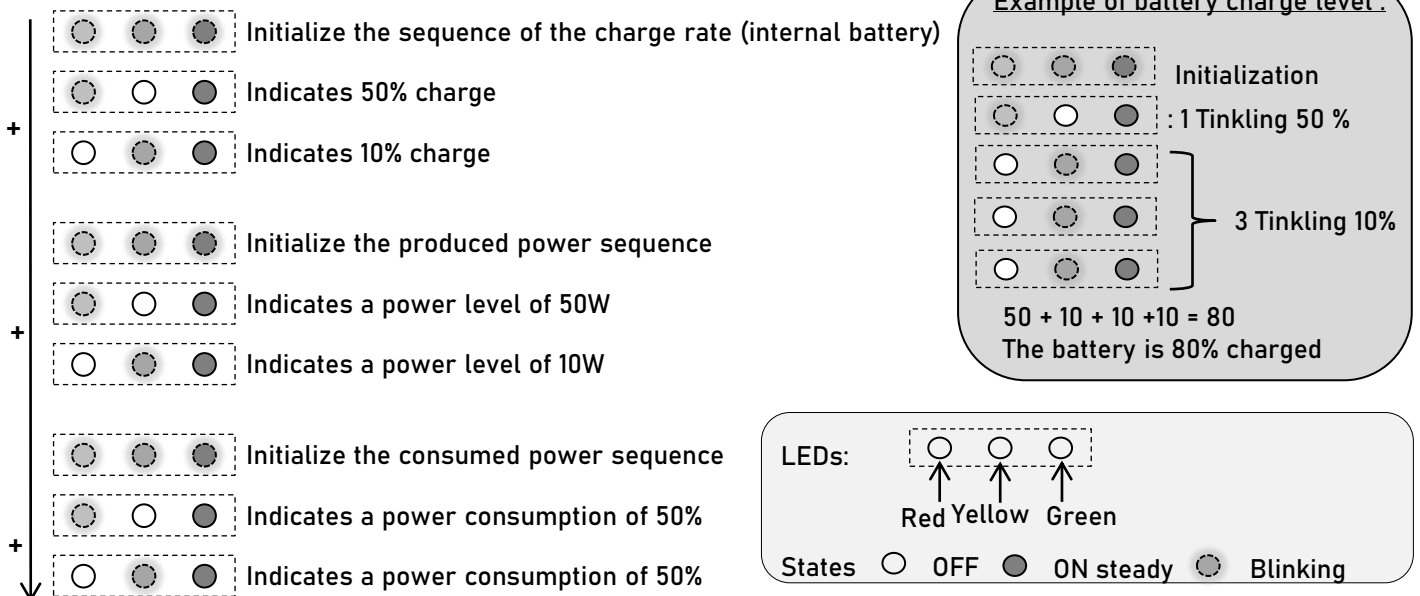
Button : - a **long press (3s)** turns on the unit.
 - If there is problem when operating KiweeOne, **press this button 10s** to force a **shutdown**.
 - Directly after turning on the unit, a **short press** switches to **“Controlled Rewinding”** mode.

Button : - a **long press (3s)** on this button takes you to the **next operating step**. To go from one step to another, the system requires a **double validation**.
 Steps : ON > Unwind > Launch wind turbine > Production mode > Stop production > Rewind
 - Once the unwinding step has been passed, a **short press starts/stops the propeller**.
 - In **“Controlled Rewinding”** mode, **pressing this button will rewind until you release it**.

The green, orange and red LEDs give the following information : off state, on state, phase in execution, execution failure, awaiting double validation, full battery.

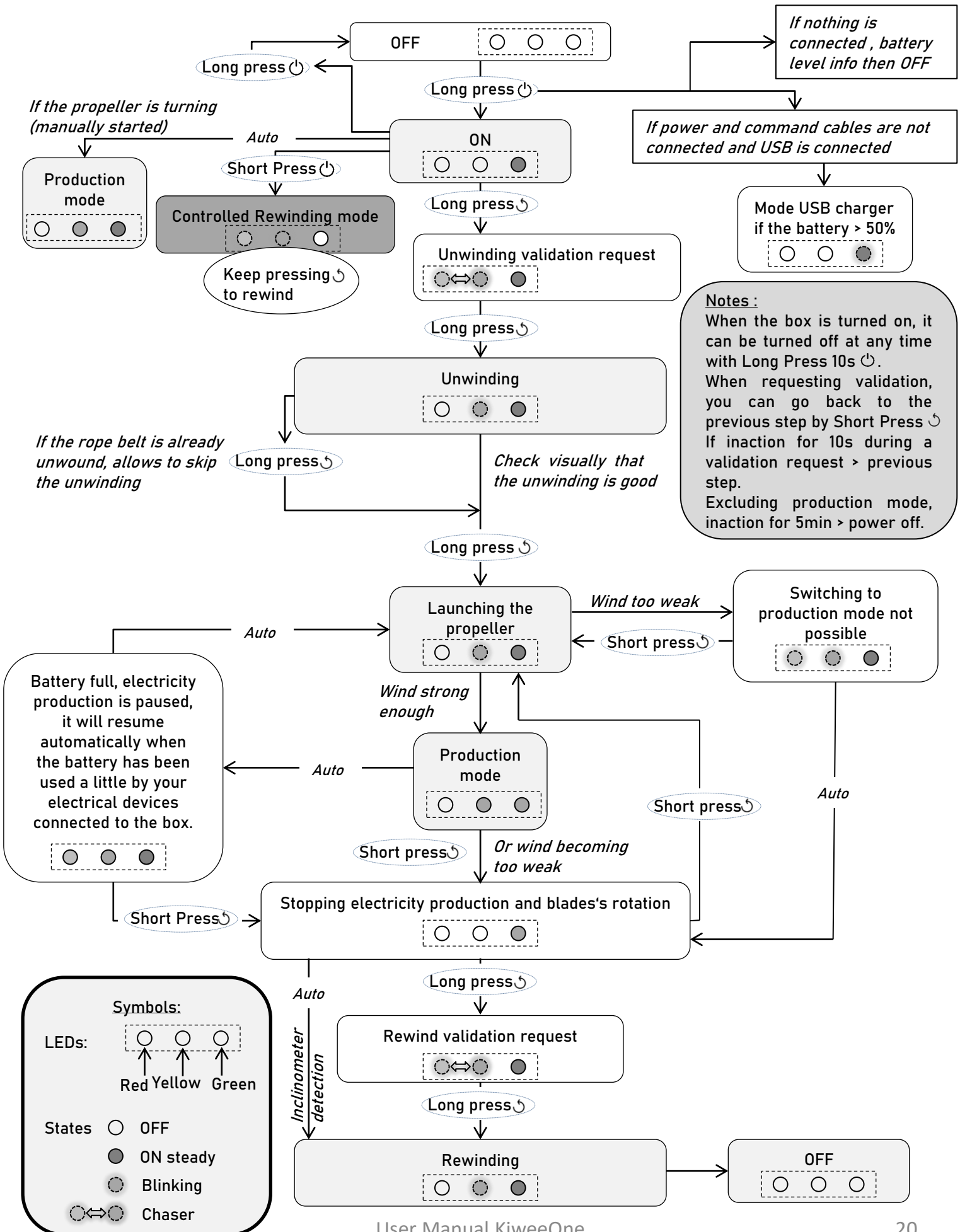
The sticker on the electrical box summarizes the color codes associated with this information. The detailed use of the electrical box can be found on p20 (function block diagram). We recommend that you familiarize yourself with this diagram before using your KiweeOne.

The LEDs also make it possible to know the state of charge of the internal battery, the total power produced by the wind turbine and the power consumed by the electrical outputs of the box. Every minute, the following sequence giving this information will start automatically. After initialization, the number of flashes must be added.



Pairing the generator : the generator must be paired to the electrical box. At first start up, it is necessary to configure it. Switch on the unit : long press ON and then make a long press on both buttons simultaneously. The generator runs at low speed for a minute, help the thread to unwind properly (1 meter). It then turn off automatically. At next power on the generator is paired to the electrical box.

Function Block Diagram



7. Maintenance

Like any mechanical system, some KiweeOne components must be replaced from time to time. Regularly check the overall condition of your wind turbine, and follow the tips below to replace excessively worn or damaged parts. Replacement parts are available on kitewinder.fr. Please contact us for any inquiries.

7.1 Rope belt

The thread of the rope belt may become damaged over time with the use of the KiweeOne due to possible friction. The first signs of wear should be seen at the knot of the loop. If the knot appears damaged it may be better to cut it and redo it. This is a fisherman's knot made as below. This type of knot is not valid for a "Dyneema" type belt. When all the thread is too damaged, replace it with a new rope belt.



7.2 Toothed Belt

HTD 501 3M toothed belt may show various damages requiring replacement :

- One ore more broken teeth
- Elongation (the belt skips steps on the pulley)
- Excessive wear on the back or the sides (white fiber reinforcement appears)

7.3 Bearings

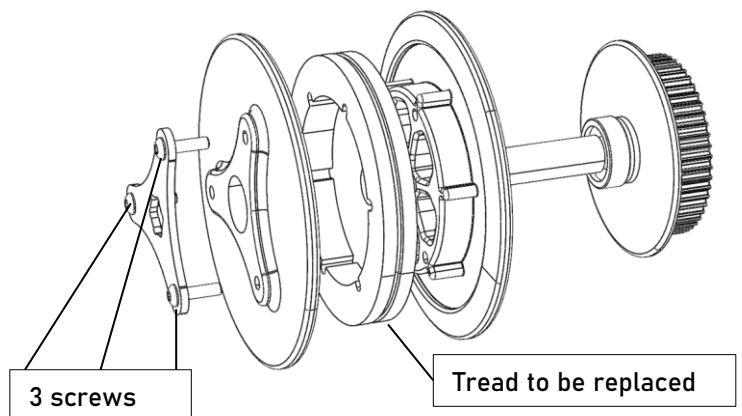
The KiweeOne bearings are designed to last at least two years. However, shock or misuse can shorten their lifespan. Individually rotate the bearings of the KiweeOne. If you hear a noise, or feel any irregularity in movement, the bearing should be replaced. The bearings of the toothed pulley and those of the pulley support can be changed. If a smooth pulley bearing is damaged, the complete pulley must be replaced.

7.4 Treads

The PU treads of the generator and the wind turbine (in contact with the rope belt) must be replaced when they are too worn.

Unscrew the 3 screws from the pulley. Remove the aluminum plate. Remove the pulley side. Extract the worn tread and replace it with a new one.

Replacing the generator tread requires extensive disassembly. Please contact us when you need to replace it.



7.5 Blades

The blades must always be replaced in pairs, even if only one is damaged. Indeed, the blades are paired to ensure optimal balancing. Replacing only one blade could lead to excessive vibrations, which will cause premature wear of the various components.

The blades can be damaged by unusual impacts or by natural abrasion from contact with air.

7.6 Miscellaneous mechanical parts

The KiweeOne wind turbine experiences vibrations related to its operating principle. Some mechanical parts will then be worn out until they no longer serve their original function. They will then have to be replaced. Here is a non-exhaustive list of wearing parts that may need to be replaced first due to excessive mechanical slack :

- Pulley reinforcement plate (10)
- Axle reinforcement plate (12)
- Toothed pulley (4)
- Vane (6)

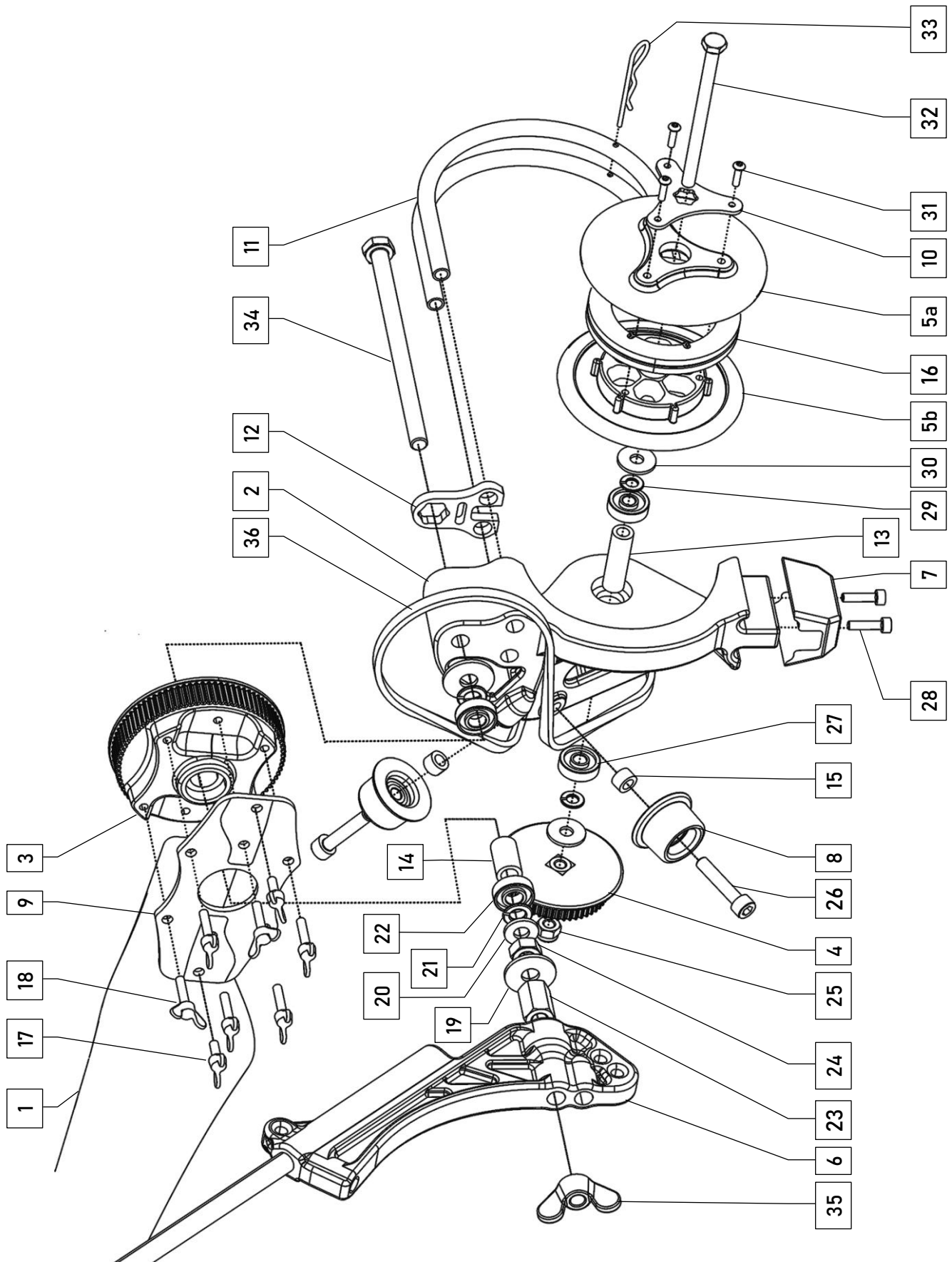
Please contact us for all other maintenance questions, especially related to the generator part.

8. Troubleshooting

Issue	Description	Action
Electric box failure due to short-circuit or equipment needing too much power	Electric box in protection mode	Disconnect all equipment and reconnect
The automatic control of the servomotor does not work	The force required to rotate the mechanism is too high	Try to unstuck it manually
The rope belt rubs on guides (generator)	The generator tilts on one side The traction of the kite is insufficient, the flight angle is too low	Check that the crank is correctly positioned on the smooth side of the reel Check that the command and power cables do not unbalance the generator
The kite cannot lift the wind turbine	The wind is too weak	Try to increase the distance between the kite and the wind turbine by attaching the omega lower on the safety line
The kite is not stable in strong winds	The geometry of the kite does not allow stability in very powerful wind, it is necessary to add a tail	Attach the kite storage bag to the back of the kite (tail)
The rotation of the blades does not start	Not enough wind Not enough battery for automatic start of the blades rotation	Wait for the wind to become sufficient Manually start the propeller with the rope belt Charging the battery
Blades are rotating but no electricity is produced	Mechanical transmission problem or electric problem Battery too low	Check the bearings Check that the rope belt is in the tread on the generator and on the wind turbine Check the position and the wear of the toothed belt Check fuse Check connections Wait for charge
Abnormal noise from the generator	Item loose or touching a rotating part	Check the tightness of the screws Check the position of the locking tab, in production mode, slightly changing its position can make the problem disappear

Please contact us for any other issue.

9. Part list



Id	Name	Id	Name
1	Blades x2	20	Washer M8
2	Pulley support	21	Grower washer M8 x2
3	Main toothed pulley	22	Bearing ZZ 8mm x2
4	Toothed pulley	23	Hexagonal column M8
5	rope belt pulley	24	Nut M8
6	Vane	25	Nylstop Nut M6
7	Tube holder	26	Screw CHC M6x35 x2
8	Smooth pulley x2	27	Bearing ZZ 6mm x2
9	Clamping plate for the blades	28	Screw CHC M4x25 x2
10	Pulley Reinforcement plate	29	Grower washer M6 x2
11	Rope guide x2	30	Large washer M6 x2
12	Axle reinforcement plate	31	Screw BHC M3x20 x3
13	Secondary axis pacer	32	Screw TH M6x90
14	Blades pulley spacer	33	Safety pin
15	Small pulley spacer x2	34	Screw TH M8x130
16	Tread	35	Butterfly nut M8
17	Butterfly screw M4x12 x2	36	Toothed belt 3M
18	Butterfly screw M4x25 x6		
19	Large washer M8 x2		

Thank you for purchasing KiweeOne airborne wind turbine. We hope that you will be completely satisfied with it. For any questions about its use, please contact us by email or phone.

